A MACDONALD-LAURIER INSTITUTE PUBLICATION

FLOATING A DIFFERENT BOAT

Operationalizing airships for homeland security in the Arctic

Cam Kovarek

TRUE NORTH IN CANADIAN PUBLIC POLICY

November 2023

TRUE NORTH
IN CANADIAN PUBLIC POLICY

BOARD OF DIRECTORS

ADVISORY COUNCIL

RESEARCH ADVISORY BOARD

Contents

The author would like to thank Dr. Barry Prentice for his consideration in reviewing and providing feedback to this article, as well as Dr. Bob Boyd for his time spent in interviews and follow-up-conversations.

Cover photo: Renée Depocas (using Lockheed Martin; Cpl Jax Kennedy | flickr.com/photos/cfcombatcamera; iStock)

Executive summary | *sommaire*

Although often used interchangeably, the terms blimp, dirigible, aerostat, and zeppelin are not synonymous; they refer to variations of airships that comprise the family of systems called "lighter than air" (LTA) platforms. The airships of today are more versatile than their historical and sometimes infamous counterparts: they can be piloted by a crew, operate unmanned by remote direction, or be left tethered and unattended. Their design is inherently safe. Hybrid airships can lift and transport weight at a much more efficient rate than airplanes and helicopters. Airships also don't require long runways or large swaths of tarmac as they are capable of vertical take-off and can land on nearly any surface, including ice, snow, and water.

The United States Navy disbanded its airship corps after World War II, but airships could be ready for a comeback as opportunities are emerging for LTA platforms in the commercial and military sectors. Their inherent capabilities coupled with technological advances in the last half century make airships a viable solution for many situations. Further, the potential for them to be driven by alternative power sources may make airships not only a cheaper option, but a "greener" one as well.

One of the situations LTA platforms could address is North American Arctic security. In the last decade the Northwest Passage and Northern Sea Route have become increasingly attractive for maritime shipping and, accordingly, more contested.

All efforts to defend the Arctic face considerable challenges. Geography, climate, and weather collectively undermine the reliability of logistics, infrastructure, and communications in the Arctic. Warming temperatures seasonally destabilize some Arctic terrain, rendering overland travel increasingly hazardous. The inconsistent supply of food, medical supplies, and building materials further undermines the stability of the High North. The United States and Canada are also hindered by a dearth of icebreakers and deep-water port facilities in the Arctic, both of which limit access to the region for military and economic purposes.

The United States and Canada are probably not doing enough to improve the security of their northernmost reaches. If we want to improve our defences in the Arctic, we must employ versatile, capable airships to help – but this time, give them to the Coast Guard.

The United States Coast Guard is charged with defending maritime borders and operates as a law enforcement organization, a regulatory agency, part of the intelligence community, a first responder, and is responsible for maritime safety, security, and environmental stewardship in ports and waterways. It is also responsible for maritime drug and migrant interdiction, as well as various law enforcement functions.

Airships could be readily employed to support nearly every one of the Coast Guard missions, both within and beyond the Arctic. They can easily maneuver beyond the range of small-arms fire while preserving their ability to incapacitate a hostile vessel. Their ability to land on water in up to eight-foot seas means small boats can be deployed from them for law enforcement purposes. An airship's physical stability – even in dangerous weather conditions – combined with its lower maneuver speed and ability to hover would minimize risk during migrant interdiction or search and rescue missions. In the event of environmental disasters such as oil spills, airships could serve as reconnaissance platforms to assess the scope of the incident.

Even more noteworthy, however, are the opportunities for expanded intelligence collection against adversaries – a function that is critical to improving surveillance in the Arctic. There are myriad possibilities when it comes to outfitting LTA platforms with payloads and sensors to detect, track, monitor, and report against adversary activity in the maritime domain.

Flying and maintaining airships will be far more affordable than operating conventional airframes due to greater fuel efficiency and lower maintenance requirements. And at least one of the airship models, the Z1, could be ready for defence missions as soon as 2027.

Should the United States military decide to operationalize airships, they may yet outmaneuver their strategic competitors with one slow, steady, and lighter-than-air solution. **MLI**

***Bien qu'ils soient souvent employés indifféremment**, les termes « dirigeable », « aérostat » et « zeppelin » ne sont pas des synonymes ; ils désignent des variantes d'aéronefs de la famille des systèmes appelés « aéronefs plus légers que l'air » (LTA). Les aéronefs modernes sont plus polyvalents que leurs équivalents parfois tristement célèbres du passé : ils peuvent être pilotés, télécommandés ou retenus au sol sans assistance. Leur conception est sûre en raison de leur nature. Les aéronefs hybrides peuvent soulever et transporter de lourdes charges beaucoup plus efficacement que les avions et les hélicoptères. En outre, ils ne nécessitent pas de longues pistes ni de grandes aires pour décoller ou atterrir, car ils peuvent s'élever verticalement et se poser presque partout, y compris sur la glace, la neige et l'eau.*

La marine s'est départie de sa flotte après la Seconde Guerre mondiale, mais les aéronefs pourraient faire un retour en force compte tenu des besoins émergents en plates-formes plus légères que l'air dans les entreprises et le secteur militaire. Les aéronefs offrent des solutions viables dans de nombreuses situations en raison de leurs capacités intrinsèques, conjuguées aux progrès technologiques réalisés au cours des cinquante dernières années. De plus, le fait qu'ils puissent être propulsés par des sources d'énergie de remplacement pourrait faire d'eux une option non seulement moins coûteuse, mais aussi plus « verte ».

Un enjeu auquel les LTA pourraient répondre est celui de la sécurité de l'Arctique canadien et américain. Au cours de la dernière décennie, la voie maritime du Nord et le passage du Nord-Ouest sont devenus de plus en plus attrayants pour la navigation maritime et, par conséquent, de plus en plus disputés.

Tous les efforts pour défendre l'Arctique se heurtent à des défis considérables. La géographie, le climat et les conditions météorologiques compromettent collectivement la fiabilité de la logistique, des infrastructures et des communications. Le réchauffement saisonnier fragilise certains sols, rendant les déplacements terrestres de plus en plus hasardeux. L'accès irrégulier aux vivres, aux fournitures médicales et aux matériaux de construction nuit encore plus à la stabilité du Grand Nord. Le manque de brise-glaces et d'installations portuaires en eau profonde limite l'accès à la région pour des motifs militaires et économiques : d'autres obstacles pour les États-Unis et le Canada.

Les États-Unis et le Canada n'en font probablement pas suffisamment pour améliorer la sécurité de leurs régions les plus septentrionales. Si nous souhaitons améliorer notre défense dans l'Arctique, nous devons recourir à des aéronefs polyvalents et performants – mais en les confiant, cette fois, aux garde-côtes.

La Garde côtière est chargée de défendre les frontières maritimes et opère en tant qu'organisation d'application de la loi, agence réglementaire, membre de la communauté du renseignement et premier intervenant. Elle veille à la sécurité maritime et à la gestion de l'environnement dans les ports et sur les voies d'eau. Ajoutons à cela la lutte contre la drogue et les interceptions de migrants, ainsi que diverses autres fonctions d'application de la loi.

Les aéronefs pourraient être utilisés rapidement par la Garde côtière pour soutenir la quasi-totalité de ses missions, tant dans l'Arctique qu'au-delà. Ces appareils peuvent facilement éviter les tirs d'armes légères tout en jouissant du potentiel nécessaire pour neutraliser un navire hostile. Leur capacité d'amerrissage (dans les eaux maritimes d'une hauteur maximale de huit pieds) rend possibles le chargement et le déploiement sur l'eau de petites embarcations pour le maintien de l'ordre. La stabilité physique d'un aéronef – même dans des conditions météorologiques dangereuses – combinée à sa vitesse de manœuvre plus faible et son aptitude au vol stationnaire permet de minimiser les risques inhérents aux missions de recherche et de sauvetage et aux interceptions de migrants. En cas de catastrophe environnementale (marée noire), les aéronefs

pourraient aussi servir de plates-formes de reconnaissance pour évaluer l'ampleur des dégâts.

Mais ce qui est encore plus remarquable, ce sont les possibilités qu'ils offrent d'élargir la collecte de renseignements contre les adversaires – une fonction essentielle en vue d'améliorer la surveillance dans l'Arctique. Les occasions d'équiper une plate-forme LTA sont pratiquement illimitées : charges utiles et capteurs de toutes sortes permettant de détecter, de retracer, de surveiller et de signaler les activités douteuses dans le domaine maritime.

Les aéronefs seront beaucoup plus abordables que les avions conventionnels, en partie parce que leurs besoins en entretien sont moins grands. Au moins un des modèles, le Z1, pourrait être prêt pour les missions de défense dès 2027.

Si l'armée américaine décidait de mettre en service des aéronefs, elle pourrait surpasser ses concurrents stratégiques grâce à une solution aisée, graduelle et… plus légère que l'air. **MLI**

Introduction

In 2012, I had just commissioned in the United States Navy and arrived at Pensacola Naval Air Station for twelve weeks of secondary training. The base is known as the "Cradle of Naval Aviation" – a distinction earned at the take-off of the first Navy aircraft in 1914 and maintained ever since as the training site for Navy pilots, flight officers, and enlisted aircrewmen. I was not at all surprised when, wandering around one of the many antique shops in the area, I found literal stacks of aircrew patches. One, however, caught me off-guard because the embroidered image was not an airplane or a helicopter, or even a squadron mascot – it was an airship, a *Navy* airship.

Although often used interchangeably, the terms blimp, dirigible, aerostat, and zeppelin are not synonymous; they refer to variations of airships and, more technically, comprise the family of systems called "lighter than air" (LTA) platforms. Of these, hybrid airships are those that generate their lift through a combination of an LTA gas (like hydrogen or helium) and aerodynamic forces (similar to an airplane or helicopter).[1] The airships of today are more versatile than their historical and sometimes infamous counterparts: they can be piloted by a crew, operate unmanned by remote direction, or be left tethered and unattended. Their design is inherently safe, such that the platforms actively struggle to crash.[2] Hybrid airships can lift and transport weight at a much more efficient rate than their fixed- and rotary-wing counterparts (i.e., airplanes and helicopters).[3] Airships also don't require long runways or large swaths of tarmac, as they are capable of vertical take-off and can land on nearly any surface (including ice, snow, and water).

The Navy disbanded its airship corps after World War II, and the airframes have been largely absent from the skies ever since. There are a few exceptions, of course. Tethered, unmanned airships – or aerostats – entered

military service decades ago, and blimps sometimes make appearances at sporting events for commercial advertisement purposes. But now, airships could be postured for a comeback, as more opportunities are emerging for LTA platforms in the commercial and military sectors. Their inherent capabilities coupled with technological advances of the last half century make airships a viable solution in a broad range of use cases; this is especially true in light of concerns about climate change, as the potential for alternative power sources may make airships not only a cheaper or more reliable option, but a "greener" one as well. Numerous start-up companies have emerged in the tourism and industry sectors, and at least one major defence firm is moving toward production of a manned, hybrid platform. To that end, an unassuming press statement was released in May of this year; it stated:

> Lockheed Martin believes in the potential for hybrid airships to transform global transport... We are pleased to share that the hybrid airship [intellectual property] and related assets have been transitioned to a newly formed, commercial company called AT^2 Aerospace. [The company] is extending [its] work to bring hybrid airships to fruition. The AT^2 team is developing airship solutions to support commercial and humanitarian applications around the world.

This announcement bodes well for the future of airships. For those not in the small but determined community of LTA enthusiasts, what it means is this: a project that has remained nascent within the confines of the defence contracting system for more than two decades has been released to the private sector for development. Today, all that stands between concept and reality is investment.

While now might be the right time, integration of airships into the modern era will rely on finding the right tasking, for the right entities in the right places. This paper will argue that if we as nations want to improve our defensive posture in the Arctic, we must employ airships as multi-mission, counter-threat platforms – but this time, give them to our Coast Guard.

Preparing at home for the fight abroad

Most discussions of strategic competition focus on geopolitics and the United States' presence on the international stage. As Russia and China work to expand their influence, political science papers and policy recommendations for national defence are published on a near-daily basis to address questions of military force projection, economic maneuvering, and diminishing natural resources. Many tacticians would agree that the best offense is a good defence: physical presence abroad, investment toward multilateral partnerships, and the effective wielding of political clout are all viable strategies to prevent threats from reaching our shores. But, as the proverbial Bear and Tiger continue to encroach, what are the United States and Canada doing to improve the security of their northernmost reaches? The short answer is "probably not enough", and this is becoming increasingly apparent in the Arctic.

The North American Aerospace Defense Command (NORAD) is a binational military organization responsible for aerospace warning, aerospace control, and maritime warning for North America. Although this paper lends more focus to LTA applications in United States, the discussion is highly relevant to Canada – partnerships are a key tenant of Arctic security and, as such, our efforts must remain collaborative to be effective.

Within the United States Department of Defense (DOD), the US Navy is the military service component responsible for maintaining maritime forces capable of deterring or defeating foreign adversaries and supporting national security objectives through sustained forward presence. Conversely, the Coast Guard, while still a member of the United States Armed Forces, falls under the Department of Homeland Security. The Coast Guard is charged with defending our nation's maritime borders and operates as "a law enforcement organization, a regulatory agency, [part of] the Intelligence Community, [a first responder, and] the principal Federal entity responsible for maritime safety, security, and environmental stewardship in [the United States'] ports and waterways."[4] The service is accordingly afforded a broad range of authorities and controls an adaptive, responsive force capable of covering the 95,000 miles (153,000 km) of shoreline and 4.5 million square miles (11.7m km^2) under their jurisdiction.[5]

Alaska is critical to the United States in matters concerning the Arctic, if for nothing other than its location. Because the state extends above 66° 30'N, the United States is considered an Arctic nation and afforded membership within the Arctic Council. (Additionally, Alaska's 6,600 miles [10,620 km] of coastline further defines the country as a littoral one and guarantees its inclusion among the more exclusive "Arctic Five.")[6] But here, geography is as much a vulnerability as it is an asset. The region, once remote by nearly every measure, has been altered drastically by global warming over the last few decades. Previously inaccessible resources are becoming available for exploitation as unprecedented volumes of ice melt. Shipping traffic has consequently increased, and the trend is likely to continue as more countries engaged in maritime trade begin utilizing the shorter, more cost-effective routes via the Arctic Ocean.

> *The Northwest Passage and Northern Sea Route are becoming increasingly attractive options for maritime shipping and, accordingly, more contested.*

For this reason, the Northwest Passage and Northern Sea Route are becoming increasingly attractive options for maritime shipping and, accordingly, more contested in the last decade.[7] The matter is complicated by Canada's declaration of authority for the Northwest Passage and Russia's insistence of their own dominion over the Northern Sea Route. While the two Arctic nations recognize each other's respective claims, the rest of the international community does not recognize either one. These disputes focus on the routes' current classification as internal territorial waters. Opponents of the Russian and Canadian territorial claims contend that these routes should be defined as international straits and governed as such under the United Nations Convention of the Law of the Sea (UNCLOS).[8] Were this to happen, Canada and Russia would maintain the legal right to regulate shipping but would not be allowed to restrict or otherwise interfere with transit passage through either route.

In a recent report to Congress, the DOD and Coast Guard underscored the importance of expanding and maintaining domain awareness in the Arctic.[9] Long-range early warning radars coupled with airborne and maritime patrols allowed for sufficient threat monitoring during the Cold War, but there now exists a pressing need for integrated sensors and persistent surveillance. In the Arctic, the three maritime choke points along the Northwest Passage and Northern Sea Route – the Bering Strait, Baffin Bay, and the Greenland-Ireland-UK (GIUK) gap – are arguably the most important locations for increased monitoring. A move by the United States to prioritize intelligence, surveillance, and reconnaissance (ISR) in these locations would likely result in improved strategic awareness and maritime dominance, as well as improved security for sea lines of communication and shipping routes.

Geography, climate, and weather collectively undermine the reliability of logistics, infrastructure, and communications in the Arctic. For instance, warming temperatures seasonally destabilize portions of Alaska's terrain, rendering overland travel increasingly hazardous. These sorts of challenges increase the complexity of both defence and security considerations, as the scarcity or inconsistency of food, medical supplies, and building materials may further undermine the stability of the High North. The United States and Canada are further hindered by the dearth of icebreakers and deep-water port facilities in the North American Arctic, both of which limit access to the region for military and economic purposes.

The area of most immediate concern to the United States is the exclusive economic zone (EEZ) around Alaska. As defined by UNCLOS, the zone extends 200 miles (322 km) from the coast and includes territorial waters; it demarcates the boundary within which only the coastal country (the United States here) is allowed to capitalize on resources like minerals, fish, and energy.[10] The waters of an EEZ are not as tightly controlled as those within a nation's territorial boundaries and foreign vessels are allowed to navigate these waters as they would in the high seas. The Bering Strait, which serves as an exit/entry point for the Northwest Passage (NWP) and the Northern Sea Route, is a definitive international transit corridor and accommodates high volumes of shipping traffic. The legality of foreign presence in the Alaskan EEZ does little to put American security professionals at ease when a Chinese battle group appears off the Alaskan coast (which has occurred three times since 2021).

If protecting the sovereignty of domestic territory in the Arctic is an evident first security priority, matters affecting Canada should be a close second. Our shared defence pact is a strong one, which makes the concerns of our northern neighbours inherently bilateral.

It is important to note that while the United States does not officially recognize Canadian dominion over the NWP, the two countries have a polite agreement to ask and, in turn, unconditionally grant permission for passage. China has expressed significant interest in utilizing the NWP for shipping, even going so far as to publish a guide to navigating the route in 2016.[11] The government has at times implied support for Canada, but an incident in 2021 involving a state-sponsored circumnavigation voyage called China's future intentions into question.[12]

China has persistently attempted to involve itself in Arctic affairs. Despite having a northernmost latitude of only 54° N, the Asian superpower has branded itself a "near-Arctic state" on a vague basis of proximity and economic investment. China has also sought to establish a physical foothold in Greenland. These efforts have been largely unsuccessful – for example, of the seven mining projects proposed since 2014, only one has been confirmed to be operational as of 2022.[13] Nonetheless, the close proximity of these activities is problematic at best, as the United States' northernmost military installation, Thule Space Force Base, remains operational in northern Greenland. Our defence partnership with Denmark had thus far tempered China's ventures, as it's understood that their presence in Greenland would be entirely too close for American comfort.[14]

Russian and Chinese naval vessels have nevertheless continued their incursions into the United States's EEZ near Alaska, including a demonstration of combined operations in October 2022. Their rhetoric and posturing, although not illegal, signal a heightened risk to the American homeland, and strategists have begun to reconsider our domestic defence posture. Perhaps unexpectedly, airships may offer an effective solution to countering maritime threats posed by strategic competitors in the Arctic. Possible applications will be discussed in the following sections.

"Behold, the majestic dirigible!"

Often recalled as a somewhat ill-boding icon of a bygone era, the ballooned behemoths of yesteryear are undeserving of the notoriety bestowed upon them by a series of accidents during the 1920s and 1930s. Public memory of the German *Hindenberg* and its fiery crash at Lakehurst Naval Air Station, New Jersey in 1937 has ostensibly contributed to the perpetual and widespread rejection of airships – despite the fact that many of these disasters were avoidable. The Italian-built *Roma*, for instance, was very likely filled with contaminated hydrogen, which would have increased its flammability far beyond that of pure hydrogen.[15] The downing of the *USS Akron* and the loss of 73 passengers onboard in 1933 was assessed to have been caused by poor handling at sea.[16] Even the infamous combustion of the *Hindenburg* could have been prevented – the airship was not designed to be filled with hydrogen, as it was during its fateful last flight.

It is less well-known, though, that the Navy kept its LTA Corps active for several decades after these incidents took place. Established in 1915, the flyers served in both World Wars and supported reconnaissance and search and rescue missions during peacetime. The airships weren't grounded until 1962, almost half a century after their first flight in service to the Navy.

Today, aviation platforms designated as airships gain their lift from a buoyant gas that is lighter than air and can navigate under their own power. There are many subordinate designations, but this article is focused on manned, hybrid airships because of the diverse range of capabilities they are able to support. Despite the contentious history of their predecessors, the new generation of airships are demonstrably safe, reliable, quiet, power-efficient, and cost-effective. They require little-to-no dedicated space for takeoff and landing and, consequently, have enormous potential for a multitude of current and emerging problem sets.

Remarkably, modern airships have the potential to disrupt the air transport and cargo industries. the LMH-3, for instance, is the largest of the designs previously developed under Lockheed Martin; it can haul up to 500 tons – and at a much lower cost than its fixed-wing counterparts. As such, an organized effort has emerged in Canada advocating for the employment of airships to support its mining industry, which struggles with inaccessibility in the nation's northernmost reaches.

A handful of companies in the private sector are currently working to produce redesigned airship models for transport and logistics: Flying Whale of France is investing in LTA as a means to move heavy cargo to and from remote locations. OceanSky of Sweden raised capital through the sale of advance tickets for the first-ever commercial airship cruise to the North Pole, set to take place in 2024 or 2025.[17] Hybrid Air Vehicles in England is also advancing toward production of their Airlander 10 multi-mission platform.[18] Notably, Google co-founder Sergey Brin started another company in 2015 – aptly-named Lighter Than Air; their Pathfinder 1 rigid airship prototype was revealed in 2023 and is scheduled to begin outdoor testing soon.[19]

> *Given the unique nature of airships, there are still a number of barriers to realization of their full potential.*

But given the unique nature of airships, there are still a number of barriers to realization of their full potential. The military is often the first to utilize emerging capabilities, and the subsequent testing and sustained operational employment have traditionally helped establish precedent for public use. Airships have been used on occasion by the United States military in recent years, but only in a very narrow capacity as experimental platforms for new sensors and capabilities. (Conversely, the airship's less mobile cousin, the tethered aerostat, is used in nearly every theatre of operations as a reliable means for persistent surveillance.) However, the US Marine Corps has, as of this year, started to evaluate the Airlander 10 for utilization in support of their expeditionary advanced base (EABO) and littoral operations in a contested environment (LOCE) concepts.[20]

Airship technology has applications far beyond these spare inceptions, including those with implications for strategic competition and homeland defence – and those opportunities are emerging faster than the platforms are likely to be built. The remainder of this article will address the utilization of manned LTA platforms to support Arctic defence and security in the context of deterrence and with specific consideration for ISR functions and the Coast Guard's statutory missions.

Deterrence and detection

General Terrence O'Shaughnessy was serving as the commander of United States Northern Command (USNORTHCOM) and NORAD when he was called to testify before Congress on the United States' policy and readiness posture in the Arctic. On March 3, 2020, Gen. O'Shaughnessy made the following statement before the Senate Armed Services Committee:

> The Arctic is the new frontline of our homeland defense as it provides our adversaries with a direct avenue of approach to the homeland and is representative of the changing strategic environment in our area of responsibility. More consistently navigable waters, mounting demand for natural resources, and Russia's military buildup in the region make the Arctic an immediate challenge... [Our] commands are especially focused on improving our ability to defend our northern approaches. We cannot deter what we cannot defeat, and we cannot defeat that which we cannot detect. In order to effectively defend the homeland, USNORTHCOM and NORAD... are moving with a sense of profound urgency to bring these capabilities into the fight.[21]

Domain awareness – in this case, maritime domain awareness (MDA) – is critical to our ability to detect aggressive or opportunistic action in the battlespace. Both the DHS and the US Coast Guard strategies prominently feature MDA. The DHS *Strategic Approach for Arctic Homeland Security* claims "[securing] the homeland through persistent presence and all domain awareness" as the first of the Department's three overarching goals.[22] In their *Arctic Strategic Outlook*, the Coast Guard establishes "[enhancing] capability to operate effectively in a dynamic Arctic" as their first line of effort (LOE) and identifies "[establishing] persistent awareness and understanding of the Arctic domain" as a critical component to operational success.[23] The subsequent discussion of MDA conveys its importance to multiple planning considerations – including resource allocation and threat assessments – and the impact valid information can have on decision-making at the tactical, operational, and strategic levels.[24]

"Deterrence by detection" (DbD) is one of several theories that supports ISR as a viable means to prevent escalation or aggression. The framework was introduced in 2020 and is derivative of deterrence theory, which came

to prominence around matters of nuclear security during the Cold War. Traditional deterrence theory aims to prevent an adversary from taking action by messaging the severity, certainty, and celerity of a response. The enemy's perception is the basis for deterrence theory: they must believe that they are unlikely to succeed; that the benefits of their success are minimal while the consequences of their failure are substantial; and that their opponent is fully capable of executing the threatened counteraction.[25]

The authors of DbD defined the four qualities that an ISR network must have to be successful as a means of deterrence. First, platforms must be *visible*: the adversary should know they are being observed and, ideally, will expend their own ISR resources "watching the watchers".[26] The network must then be *ubiquitous*, which will require the use of numerous assets to achieve persistent presence (or the perception thereof).[27] This, in turn, necessitates the third requirement: that the systems be *affordable*, such that they can be employed at scale.[28] Finally, the authors state that the ISR network must be *interoperable* so coalition forces and partner entities may contribute to and benefit from collaborative endeavors.[29] Analysts Thomas Mahnken and Grace Kim of the Center for Strategic and Budgetary Assessments published a subsequent policy brief the following year that offered a revised set of criteria. In place of interoperability, Mahnken and Kim suggest *vulnerability* as a fundamental trait of deterrent ISR networks.[30] By allowing surveillance nodes to be susceptible to attack, the state "[shifts] the onus of escalation onto the adversary. Attacking the network would be a concrete sign of aggressive intent."[31]

Two additional factors bear consideration: *presence* (in the context of ubiquity) and *timeliness*. Presence is a repeated point of contention in matters of national security – does physical presence equate to deterrence? Hardly but, in DbD, physical presence contributes to visibility. Traditional deterrence theory, by comparison, values presence more for its second-order effect: the perception that a nation-state is willing and capable of counteraction. Relative to both theories, presence is an indication of interest and investment in a region or conflict and suggests that a nation will respond accordingly to unwanted adversarial action. More directly, timeliness is a concern of application – no theoretical solution is practical if it cannot be applied to the problem in a timely matter, particularly in the Arctic region.

Many of the ISR options currently available to the United States military do not meet one or more of these requirements. For instance, the P-8 aircraft

employed by the Navy to conduct anti-submarine missions are arguably only visible; the expense to operate the platforms is significant and, paired with manning and training requirements, prevents ubiquity. In a follow-up article to their original proposal, the authors of DbD propose "networking existing ISR platforms in key operating areas and augmenting their capabilities with select investments in technology enablers... [as this approach] seeks to maximize the return on investment from assets and platforms that have already been developed and are currently operating."[32] They contend that unmanned aerial systems (UAS) like the MQ-9 Reaper and MQ-4 Global Hawk are platforms capable of sustained surveillance operations and describe how low-earth orbit satellites would ideally complement the airborne platforms in an integrated ISR network.

Neither UAS nor satellites are viable solutions for persistent ISR, particularly in the Arctic. Traditional aircraft (fixed-, rotary-, and tilt-wing) similarly present a number of challenges. Manned or unmanned, they need continual human interaction to operate both the platform itself as well as any sensors. Most airborne platforms are logistically cumbersome: they require a consistent supply chain for fuel and parts, as well as infrastructure for landing and maintenance. Aircraft are also subject to the limitations of harsh environments – like extreme temperatures and unpredictable operating conditions – that typically increase risk to mission. All these factors lead to cost ineffectiveness, as the ratio of training and upkeep hours to operational hours is low. Technological developments like artificial intelligence will almost certainly overcome some of these barriers, but it is almost equally unlikely that UAS platforms will be capable of fully automated operations in the immediate future – especially once timelines for military acquisition and integration are taken into account.

Despite military investments in the space domain, satellites are an even more complicated solution. They could be assessed as closer to ubiquity than many other networks – but they are hardly visible, and not at all affordable or timely. Much like aircraft, they require humans to operate effectively, and those operators need extensive training. It's also hard to imagine that the satellites already in operation are working below their capacity, and there is no guarantee that new intelligence requirements of regional forces will be prioritized over those of national interest. The development and acquisition costs for new satellites (especially when compared to UAS) are astronomical;

any claim made that spacecraft in low-earth orbit are cost-effective is entirely relative. Design and implementation processes are also exceptionally slow, with some project timelines surpassing a decade. Satellites and overhead surveillance are worth investment for the future, but not a viable option in the present.

The Coast Guard Airship Corps

The *Homeland Security Act* of 2002 codified the Coast Guard's domestic operations across five maritime programs: law enforcement, response, prevention, transportation system management, and security operations. Under these LOEs, the Coast Guard supports homeland security by protecting American ports, waterways, and coastal zones (to include anti- and counter-terrorism efforts); they are also responsible for maritime drug and migrant interdiction, as well as various law enforcement functions. The other missions directed to the Coast Guard include search and rescue; living marine resource and environmental protection; marine safety (enforcement and education); placement and maintenance of aids to navigation; and ice-breaking operations.

The Coast Guard is additionally tasked to conduct defence operations, under which the service leverages its diverse authorities to support the National Defense Strategy. Coast Guardsmen are globally deployable to conduct maritime intercept operations, port operations (to include security and defence), peacetime engagement, and environmental support operations; the service may also be assigned tasking as a military component of joint (multi-service) or combined (international) forces. The Coast Guard regularly conducts intelligence functions for its own missions as well as national priorities and is authorized to serve as a "specialized service" under the Navy in wartime.

The missions of the Coast Guard neatly align with the advertised capabilities of modern airships. To that end, the Z1 airship from AT^2 Aerospace (previously the LMH-1) has been identified as a viable candidate for acquisition by the Coast Guard.[33] As the smallest model of three concept designs, the Z1

has a cargo capacity of 20 tons and a top speed of 60 knots per hour (about 70 mph/110 kmph). The airship's fuel capacity and efficiency result in a 1,400 nmi maximum range (about 1,600 miles/2,575 km) – that's Anchorage to Point Barrow and back with fuel to spare. Alternatively, the Z1 can support up to a week of sustained flight without refueling. Though it is likely to maintain a much lower altitude during transit and patrol, this airframe can operate at up to 10,000 feet and is capable of both vertical and conventional take-off. It can also land on ice, snow, or even water, which enables the airship to carry, launch, and recover small boats; these could include two of the Coast Guard's MKIII cutter boats or one of the Navy's combatant craft (assault variant).

The comparably lower maintenance requirements for LTA platforms would enable the Coast Guard to spend more days on patrol per year (approximately six out of seven) and expand the service's effective range of operations. Improved response times across a broader swath of territory could, in turn, reinforce the perception of sustained presence – even when gaps in coverage exist. Finally, the Z1 is highly configurable and can be outfitted with mission-specific equipment to meet the needs of differing operational requirements (including mounted weapons systems).

> *While the speed and operating altitude of airships create an image of vulnerability, they are less so than might be expected.*

Here, it is critical to note that while the speed and operating altitude of airships create an image of vulnerability, they are less so than might be expected. The envelope – or "balloon" – contains gas under low pressure, such that small arms fire would not cause a massive gas leak (or dramatic explosion, for that matter).[34] Similarly, the infra-red seekers common to man-portable air defence systems (MANPADS) and other surface-to-air missiles typically struggle to differentiate the signature of an airship from that of a cloud.[35] Line-of-sight and active homing guidance pose a more credible threat, but the risk presented by either can be mitigated by any number of countermeasures.

In reality, the Z1 is no more or less vulnerable to offensive action than other tactical platforms.

Airships could be readily employed to support nearly every one of the Coast Guard mission sets, both within and beyond the Arctic. In the case of hostile interdictions, platforms like the Z1 can easily maneuver beyond the range of small-arms fire while preserving its ability to incapacitate a target vessel. The ability to land on water in up to eight-foot seas means small boats can be deployed to support a seizure or other law enforcement function. An airship's physical stability – even in dangerous weather conditions – combined with lower maneuver speed, ability to hover, and relative inability to stall would collectively minimize risk during migrant interdiction or search and rescue missions. The Z1 could allow the Coast Guard to more readily maintain aids to navigation in remote, inaccessible locations. And although airships can't break through the ice directly, they could provide resupply to ships conducting polar operations or otherwise improve access to the remote Arctic.

Perhaps most importantly, the Z1's operational profile – with its slow but steady pace and loiter capability – makes it an ideal host platform for a variety of sensors. Altitude provides an advantage for observers, even without cameras or other technical equipment; increased visual range enables Coast Guardsmen on watch to more quickly locate vessels in distress, assess a potential threat, or identify violations of federal maritime regulations. Elevated operations have second-order benefits for communications as well: concepts and proposals abound for the use of aerostats and blimps as VHF/UHF relays, which could help sustain or expand nodal communications networks.

Even more noteworthy, however, are the opportunities for expanded intelligence collection against adversary vessels – this function is critical to the concept of improving MDA in the Arctic. There exist almost unlimited opportunities to outfit an LTA platform with payloads and sensors to detect, track, monitor, and report against adversary activity in the maritime domain. For instance, scholarly works have already been written about the use of surveillance technologies onboard airships; these include, for instance, ground-motion tracking, tipping/cueing for electro-optical and infrared sensors, and ultra-wideband synthetic aperture radar. Consideration should also be given for signals intelligence applications, such as collection against foreign radars, communications, weapon systems, and other emitters, which may provide insight to adversary actions and intentions near the Arctic

homeland. Our ability to employ LTA platforms as part of a multi-layered mesh network of ISR systems, much as Thomas Mahnken and his co-authors suggested, could greatly expand MDA for our defence forces – especially in those places obscured by weather, poor communications, or inaccessibility.

In the case of environmental disasters such as oil spills, airships would be exceptionally capable of serving as reconnaissance platforms to assess the scope of the incident via onboard payloads. The platform could serve as a mobile node for the National Oceanic and Atmospheric Administration's (NOAA) Arctic Environmental Response Management Application. The program, also known by the acronym ERMA, is capable of integrating data from multiple sources and has been designated by the Coast Guard and other first responders for use during oil spill response and other emergency operations. Alternatively, personnel onboard the airship could collect data by deploying smaller unmanned systems (UxS), which would allow the remotely operated airborne, surface, or subsurface systems to navigate at ranges that would otherwise be unachievable. The airship would, in this scenario, function as a mobile command centre for decision-makers as well as a communications relay station for line-of-sight signals.

Airships also offer specific utility to search and rescue mission, as the time required to respond to emergency scenarios in the High North with either fixed- or rotary-wing aircraft may exceed twelve hours (and could be longer based on weather conditions). Of the 618 fatalities reported by US Coast Guard Search and Rescue in 2017, almost one third (198) occurred after notification. The ability of airships to detect distress signals, navigate hostile weather, launch recovery systems, and deliver emergency sustainment supplies could significantly improve response times and survival rates.

Many potential applications exist for airship employment by the Coast Guard and other relevant defence organizations:

- Deployment of leave-behind sensors to support monitoring and surveillance for MDA and intelligence missions.
- Utilization by NORAD to support its maritime surveillance mission, particularly over the Northwest Passage, Baffin Bay, and other littoral waters around Canada. Similarly, members of the NATO could use the platforms to support the air policing mission in the vicinity of Iceland and, possibly, the Greenland-Ireland-United Kingdom (GIUK) Gap.

- Employment by TRANSCOM to support the relocation of riverine and combatant craft for the other armed services. These movements, often required for maintenance periods, training, or regional deployments, currently rely on freight trucks, military aircraft, or transport shipping, all of which will be impeded in the Arctic region. In general, airships could support assured logistics to current and future military installations.
- Collaboration with the Federal Emergency Management Agency and other disaster response organizations to improve emergency preparedness for the most vulnerable populations of Alaska. Addressing food insecurity, limited medical access, insufficient housing, and other material shortages related to human security concurrently with defence tasking may serve to improve the region's overall resiliency.
- Partnership with NOAA for the collection of atmospheric and oceanographic data, as well as the delivery of researchers and other personnel to remote locations.

When a plan really floats together

If assessed using the DbD framework, the Z1 scores remarkably well as a potential deterrence solution. The airship is easily *visible* to observers on the ground when flying at or above the recommended altitude. Its relatively slow speed and low operational altitude make it apparently *vulnerable* (although the Z1 is arguably less so than it appears). Airship operations also have the potential to be *ubiquitous* (or at least consistent enough to create the appearance of ubiquity) within a defined area, like sectors of the Alaskan coastline or near the Bering Strait. The cost to operate the Z1 is projected to be comparably low: while calculating exact figures would require a specific number of platforms and approximate flight hours, it is safe to say that flying and maintaining airships will be far more *affordable* than operating conventional airframes. Payloads, sensors, and communication systems installed on the Z1 could be selected based on in-

formation needs as well as their potential for *interoperability* with mission and coalition partners. Finally, the Z1 could be ready for defence missions as soon as 2027. Considering the requirements for acquisition and training, force implementation on that schedule would be more *timely* than many other proposals.[36]

As an old idiom goes, what we don't know can absolutely kill us – and in the Arctic, there's a lot we don't know. Platforms like the Z1 have immediate application toward persistent surveillance and stand to drastically increase maritime domain awareness around Alaskan (and Canadian) littoral waters. Should the United States military decide to operationalize airships, they may yet outmaneuver their strategic competitors with one slow, steady, and lighter-than-air solution. MLI

About the author

Cam Kovarek is a Lieutenant Commander in the United States Navy. She has completed five expeditionary and shipboard deployments during her eleven years of service. As a graduate student with the University of Alaska at Fairbanks, Cam has concentrated her studies on Arctic Security and will earn her degree in security and disaster management in December. MLI

References

Bennett, Mia. 2021. "A Chinese Sailboat Is Circumnavigating the Arctic." *Cryopolitics* (July 1). Available at https://www.cryopolitics.com/2021/07/01/a-chinese-sailboat-is-circumnavigating-the-arctic/.

Blain, Loz. 2023. "Sergey Brin's 400-Foot Airship Reportedly Cleared for Takeoff." *New Atlas* (October 26). Available at https://newatlas.com/aircraft/lta-research-airship/.

Boyd, Bob. 2023. Email: *Airships at UAF* (June 4).

Boyd, Bob. 2021 Interview with Lockheed Martin Hybrid Airship Program Manager (September 28). Phone.

Boyd, Bob. 2023. Interview with AT2 Aerospace President & Chief Operating Officer (May 10). Phone.

Cao, Yunfeng, Shunlin Liang, Laixiang Sun, Jiping Liu, Xiao Cheng, Dongdong Wang, Yiyu Chen, Meng Yu, and Kuishuang Feng. 2022. "Trans-Arctic Shipping Routes Expanding Faster than the Model Projections." *Global Environmental Change* 73 (March 1): 102488. Available at https://doi.org/10.1016/j.gloenvcha.2022._102488.

Carroll, Tobias. 2022 "OceanSky Plans Ambitious North Pole Airship Cruise." *InsideHook* (September 24). Available at https://www.insidehook.com/travel/north-pole-airship-cruise-oceansky.

Congressional Research Service. 2021. *Changes in the Arctic: Background and Issues for Congress* (No. R41153). Available at https://sgp.fas.org/crs/misc/R41153.pdf.

Defense Visual Information Distribution Service [DVIDS]. 2021. "Coast Guard Role and Missions." (January 23). Available at https://www.dvidshub.net/video/821987/coast-guard-role-and-missions-video-2021-arctic.

Eiterjord, Trym. 2021. "How a Chinese Sailboat Became a Microcosm for Arctic Geopolitics." *The Diplomat* (October 18). Available at https://thediplomat.com/2021/10/how-a-chinese-sailboat-became-a-microcosm-for-arctic-geopolitics/.

Grossman, Dan. 2013. "Worst Airship Disaster in History: USS Akron - April 4, 1933." *Airships.net* (April 13). Available at https://www.airships.net/blog/worst-airship-disaster-history-uss-akron/.

Kuersten, Andreas. "The Arctic Five Versus the Arctic Council." *The Arctic Yearbook*, 2016, 389–95.

Lajeunesse, Adam. 2016. "Chinese Prepare to Use the Northwest Passage." Arctic in Context: University of Washington (September 14). Available at https://jsis.washington.edu/aic/2016/09/14/chinese-prepare-to-use-the-northwest-passage/.

Mahnken, Thomas G. and Grace B. Kim. 2021 "Deterrence by Detection: Using Surveillance to Pre-Empt Opportunistic Aggression." NATO Defense College [Research Report]. Available at http://www.jstor.org/stable/resrep27743.

Mahnken, Thomas G., Travis Sharp, Chris Bassler, and Bryan W. Durkee. 2021. "Implementing Deterrence by Detection: Innovative Capabilities, Processes, and Organizations for Situational Awareness in the Indo-Pacific Region." Center for Strategic and Budgetary Assessments [CSBA] (July 14). Available at https://csbaonline.org/research/publications/ implementing-deterrence-by-detection-innovative-capabilities-processes-and-organizations-for-situational-awareness-in-the-indo-pacific-region.

Mahnken, Thomas G., Travis Sharp, and Grace B. Kim. 2020. "Deterrence by Detection: A Key Role for Unmanned Aircraft Systems in Great Power Competition." Center for Strategic and Budgetary Assessments [CSBA]. Available at https://csbaonline.org/research/publications/deterrence-by-detection-a-key-role-for-unmanned-aircraft-systems-in-great-power-competition.

Mazarr, Michael J. 2018. "Understanding Deterrence," *Perspectives*, 14. Available at https://doi.org/10.7249/PE295.

Pezard, Stephanie, Stephen J. Flanagan, Scott W. Harold, Irina A. Chindea, Benjamin J. Sacks, Abbie Tingstad, Tristan Finazzo, and Soo Kim. 2022. "China's Strategy and Activities in the Arctic: Implications for North American and Transatlantic Security." The Rand Corporation. Available at https://apps.dtic.mil/sti/pdfs/ AD1188961.pdf.

Prentice, Barry E. 2021. "Hydrogen Gas-Fuelled Airships Could Spur Development in Remote Communities." *The Conversation* (January 20). Available at http://theconversation.com/hydrogen-gas-fuelled-airships-could-spur-development-in-remote-communities-152730.

Sampson, Ben. 2023. "US Navy to Assess Use of Airlander Airship for Logistics." Aerospace Testing International. (April 7). Available at https://www.aerospacetestinginternational.com/news/electric-hybrid/us-navy-to-assess-use-of-airlander-airship-for-logistics.html.

United States Coast Guard. 2021. "Annual Performance Report: Fiscal Year 2020." (March). Available at https://www.uscg.mil/Portals/0/documents/budget/FY_2020_USCG_APR_Final-V3-dtd-3-16-2021.pdf?ver=2021-03-15-113137-970.

Wolf, Chad F. 2021. "Strategic Approach for Arctic Homeland Security." Department of Homeland Security (January 11). Available at https://www.dhs.gov/publication/strategic-approach-arctic-homeland-security.

Endnotes

1 This term may also be used regarding the construction of an airship's hull, which may be rigid, semi-rigid, or non-rigid; a combination of these constructions is sometimes called a "hybrid airship". This paper is only concerned with the primary definition outlined in the main body of text.

2 Reference the 2016 video of the Airlander 10 test flight, wherein the airship slowly falls to earth and settles. There was some damage to the flight deck but the crew was unharmed.

3 Airships are not estimated to be more cost-effective than cargo ships, but conversely, will not be restricted to waterways.

4 "Coast Guard Role and Missions," DVIDS, January 23, 2021, https://www.dvidshub.net/video/821987/coast-guard-role-and-missions-video-2021-arctic.

5 "United States Coast Guard Annual Performance Report: Fiscal Year 2020," March 2021, https://www.uscg.mil/Portals/0/documents/budget/FY_2020_USCG_APR_Final-V3-dtd-3-16-2021.pdf?ver=2021-03-15-113137-970.

6 See Andreas Kuersten, "The Arctic Five Versus the Arctic Council," The Arctic Yearbook, 2016, 389–95.

7 Yunfeng Cao et al., "Trans-Arctic Shipping Routes Expanding Faster than the Model Projections," Global Environmental Change 73 (March 1, 2022): 102488, https://doi.org/10.1016/j.gloenvcha.2022.102488.

8 There is not currently enough maritime traffic to support this assertion but changing environmental conditions may allow for reclassification in the intermediate future.

9 Congressional Research Service, "Changes in the Arctic: Background and Issues for Congress," (USNI News, October 12, 2021): 134, https://news.usni.org/2021/10/14/report-to-congress-on-changes-in-the-arctic-12.

10 The United States, citing concerns on matters of sovereignty and economic impacts, never ratified UNCLOS but recognizes its statutes as part of international customary law.

11 Adam Lajeunesse, "Chinese Prepare to Use the Northwest Passage," Arctic in Context: University of Washington, September 14, 2016, https://jsis.washington.edu/aic/2016/09/14/chinese-prepare-to-use-the-northwest-passage/.

12 Trym Eiterjord, "How a Chinese Sailboat Became a Microcosm for Arctic Geopolitics," The Diplomat, October 18, 2021, https://thediplomat.com/2021/10/how-a-chinese-sailboat-became-a-microcosm-for-arctic-geopolitics/; and Mia Bennett, "A Chinese Sailboat Is Circumnavigating the Arctic," Cryopolitics, July 1, 2021, https://www.cryopolitics.com/2021/07/01/a-chinese-sailboat-is-circumnavigating-the-arctic/.

13 Stephanie Pezard et al., "China's Strategy and Activities in the Arctic: Implications for North American and Transatlantic Security" (The Rand Corporation, 2022): 102, https://apps.dtic.mil/sti/pdfs/AD1188961.pdf.

14 Pezard et al., "China's Strategies and Activities in the Arctic", 16.

15 Barry E. Prentice, "Hydrogen Gas-Fuelled Airships Could Spur Development in Remote Communities," The Conversation, http://theconversation.com/hydrogen-gas-fuelled-airships-could-spur-development-in-remote-communities-152730.

16 Dan Grossman, "Worst Airship Disaster in History: USS Akron - April 4, 1933," Airships.net, April 13, 2013, https://www.airships.net/blog/worst-airship-disaster-history-uss-akron/.

17 Tobias Carrol, "OceanSky Plans Ambitious North Pole Airship Cruise," Inside Hook, September 24, 2022, https://www.insidehook.com/travel/north-pole-airship-cruise-oceansky.

18 The Airlander 10 is a redesigned version of the Long Endurance Multi-Intelligence Vehicle, which was intended for use by the United States Army before the project was canceled in 2013.

19 Loz Blain, "Sergey Brin's 400-Foot Airship Reportedly Cleared for Takeoff," New Atlas, October 26, 2023, https://newatlas.com/aircraft/lta-research-airship/.

20 Ben Sampson, "US Navy to Assess Use of Airlander Airship for Logistics," Aerospace Testing International, April 7, 2023, https://www.aerospacetestinginternational.com/news/electric-hybrid/us-navy-to-assess-use-of-airlander-airship-for-logistics.html.

21 "Changes in the Arctic: Background and Issues for Congress", 117.

22 Chad F. Wolf, "Strategic Approach for Arctic Homeland Security" (Department of Homeland Security, January 11, 2021): 16, https://www.dhs.gov/sites/default/files/publications/21_0113_plcy_dhs-arctic-strategy_0.pdf.

23 "Arctic Strategic Outlook" (United States Coast Guard, May 2019): 24, 27, https://www.uscg.mil/arctic/.

24 United States Coast Guard, 27-28.

25 Michael J Mazarr, "Understanding Deterrence," Perspectives, 2018, 14, https://doi.org/10.7249/PE295.

26 Thomas G. Mahnken, Travis Sharp, and Grace B. Kim, "Deterrence by Detection: A Key Role for Unmanned Aircraft Systems in Great Power Competition" (Center for Strategic and Budgetary Assessments, 2020): 20, https://csbaonline.org/research/publications/deterrence-by-detection-a-key-role-for-unmanned-aircraft-systems-in-great-power-competition.

27 Ibid.

28 Ibid., 21

29 Ibid., 21

30 While the quality of vulnerability had been addressed in their previous work, it was listed as a subordinate trait to "visibility" – a side effect more than an intention.

31 Thomas G. Mahnken, and Grace B. Kim. "Deterrence by Detection: Using Surveillance to Pre-Empt Opportunistic Aggression." NDC Policy Brief 01-21. NATO Defense College (January 14, 2021): 2, https://www. ndc.nato.int/news/news.php?icode=1518.

32 Thomas G. Mahnken et al., "Implementing Deterrence by Detection: Innovative Capabilities, Processes, and Organizations for Situational Awareness in the Indo-Pacific Region," CSBA, https://csbaonline.org/research/publications/implementing-deterrence-by-detection-innovative-capabilities-processes-and-organizations-for-situational-awareness-in-the-indo-pacific-region.

33 For the sake of scope, this proposal will focus almost exclusively on the Z1 (which was previously in development as the LMH-1 from Lockheed Martin).

34 Bob Boyd, Interview with Lockheed Martin Hybrid Airship Program Manager, Phone, September 28, 2021.

35 Bob Boyd, "Airships at UAF," June 4, 2023.

36 Bob Boyd, Interview with AT2 Aerospace President & Chief Operating Officer. Phone, May 10, 2023.

> “Canada shall be the star towards which all men who love progress and freedom shall come.”
>
> **– Sir Wilfrid Laurier**

Critically acclaimed, award-winning Institute

The **Macdonald-Laurier Institute** focuses on the full range of issues that fall under Ottawa's jurisdiction.

- Winner of the Sir Antony Fisher International Memorial Award (2011)
- Templeton Freedom Award for Special Achievement by a Young Institute (2012)
- Prospect Magazine Award for Best North America Social Think Tank (2018)
- Short-listed for the Templeton Freedom Award (2017)
- Cited by five present and former Canadian Prime Ministers, as well as by David Cameron, then British Prime Minister.
- *Hill Times* says **Brian Lee Crowley** is one of the 100 most influential people in Ottawa.
- *Wall Street Journal*, *Economist*, *Foreign Policy*, *Globe and Mail*, *National Post* and many other leading publications have quoted the Institute's work.

WHERE YOU'VE SEEN US

CTV

cpac FOR THE RECORD

CORUS ENTERTAINMENT

CBC news

FP Foreign Policy

tvo

The Economist

WALL STREET JOURNAL

THE HILL TIMES

THE GLOBE AND MAIL
CANADA'S NATIONAL NEWSPAPER • FOUNDED 1844

NATIONAL POST

constructive important forward-thinking excellent insightful high-quality active

Ideas change the world

WHAT PEOPLE ARE SAYING ABOUT **MLI**

The Right Honourable
Paul Martin

I want to congratulate the **Macdonald-Laurier Institute** for 10 years of excellent service to Canada. The Institute's commitment to public policy innovation has put them on the cutting edge of many of the country's most pressing policy debates. The Institute works in a persistent and constructive way to present new and insightful ideas about how to best achieve Canada's potential and to produce a better and more just country. Canada is better for the forward-thinking, research-based perspectives that the **Macdonald-Laurier Institute** brings to our most critical issues.

The Honourable
Jody Wilson-Raybould

The **Macdonald-Laurier Institute** has been active in the field of Indigenous public policy, building a fine tradition of working with Indigenous organizations, promoting Indigenous thinkers and encouraging innovative, Indigenous-led solutions to the challenges of 21st century Canada. I congratulate **MLI** on its 10 productive and constructive years and look forward to continuing to learn more about the Institute's fine work in the field.

The Honourable
Irwin Cotler

May I congratulate **MLI** for a decade of exemplary leadership on national and international issues. Through high-quality research and analysis, **MLI** has made a significant contribution to Canadian public discourse and policy development. With the global resurgence of authoritarianism and illiberal populism, such work is as timely as it is important. I wish you continued success in the years to come.

The Honourable
Pierre Poilievre

The **Macdonald-Laurier Institute** has produced countless works of scholarship that solve today's problems with the wisdom of our political ancestors. If we listen to the **Institute**'s advice, we can fulfill Laurier's dream of a country where freedom is its nationality.

MACDONALD-LAURIER INSTITUTE

TRUE NORTH IN CANADIAN PUBLIC POLICY

323 Chapel Street, Suite 300,
Ottawa, Ontario K1N 7Z2
613-482-8327 • info@macdonaldlaurier.ca

@MLInstitute
facebook.com/MacdonaldLaurierInstitute
youtube.com/MLInstitute
linkedin.com/company/macdonald-laurier-institute